

* * * * * STN Columbus * * * * *

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COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

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0.21

FILE 'EPFULL' ENTERED AT 11:28:35 ON 14 JUN 2007

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CA INDEXING COPYRIGHT (C) 2007 AMERICAN CHEMICAL SOCIETY (ACS)

FILE 'USPAT2' ENTERED AT 11:28:35 ON 14 JUN 2007

CA INDEXING COPYRIGHT (C) 2007 AMERICAN CHEMICAL SOCIETY (ACS)

=> s crosslinkable aromatic resin# and protonic acid#

L1 4 CROSSLINKABLE AROMATIC RESIN# AND PROTONIC ACID#

=> s l1 and carbonyl

L2 4 L1 AND CARBONYL

=> d l2 1-4

L2 ANSWER 1 OF 4 EPFULL COPYRIGHT 2007 EPO/FIZ KA on STN

AN 2004:39983 EPFULL EDP 20041222 ED 20041222 UP 20041222
DUPD 20041215 DUPW 200451

TIEN CROSSLINKABLE IONICALLY CONDUCTING RESIN, AND IONICALLY CONDUCTING
POLYMER MEMBRANES, BINDERS AND FUEL CELLS, MADE BY USING THE RESIN.

TIFR RESINE RETICULABLE, A CONDUCTION IONIQUE, ET MEMBRANES POLYMERES A
CONDUCTION IONIQUE, LIANTS ET PILES A COMBUSTIBLE FABRIQUES A PARTIR DE
LADITE RESINE.

IN FUJIYAMA, Satoko, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
Sodegaura-shi, Chiba 299-0265, JP;
OMI, Takehiko, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
Sodegaura-shi, Chiba 299-0265, JP;
ISHIKAWA, Junichi, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
Sodegaura-shi, Chiba 299-0265, JP;
KUROKI, Takashi, c/o Mitsui Chemicals, Inc., 5-2, Higashi-Shimbashi
1-chome, Minato-ku, Tokyo 105-7117, JP;
TAMAI, Shoji, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
Sodegaura-shi, Chiba 299-0265, JP

PA Mitsui Chemicals, Inc., 1-5-2, Higashi-Shimbashi, Minato-ku, Tokyo
105-7117, JP

PAN 2402683

DT Patent

LAF Japanese
 LA English
 LAP English
 TL English; French
 PIT WOA1 International application published with search report
 PI WO 2004090015 A1 20041021
 DS AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO
 SE SI SK TR
 EXTENSION STATES: AL LT LV MK
 AI EP 2004-724116 A 20040329
 WO 2004-JP4392 A 20040329
 PRAI JP 2003-102674 A 20030407
 IC.VER 7
 ICM C08G065-40
 ICS H01M004-96; H01M008-02

 AN 2004:39983 EPFULL EDP 20041222 ED 20060215 UP 20070523
 DUPD 20070523 DUPW 200721
 TIEN CROSSLINKED IONICALLY CONDUCTING RESIN, AND IONICALLY CONDUCTING POLYMER
 MEMBRANES, BINDERS AND FUEL CELLS, MADE BY USING THE RESIN.
 TIFR RESINE RETICULEE A CONDUCTION IONIQUE, ET MEMBRANES POLYMERES A
 CONDUCTION IONIQUE, LIANTS ET PILES A COMBUSTIBLE FABRIQUES A PARTIR DE
 LADITE RESINE.
 TIDE VERNETZTES IONENLEITENDES HARZ UND DAMIT HERGESTELLTE IONENLEITENDE
 POLYMERMEMBRANEN, BINDEMITTEL UND BRENNSTOFFZELLEN.
 IN FUJIYAMA, Satoko,c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 OMI, Takehiko,c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 ISHIKAWA, Junichi,c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 KUROKI, Takashi,c/o Mitsui Chemicals, Inc., 5-2, Higashi-Shimbashi
 1-chome, Minato-ku, Tokyo 105-7117, JP;
 TAMAI, Shoji,c/o Mitsui Chemicals, Inc., 580-32, Nagaura, Sodegaura-shi,
 Chiba 299-0265, JP
 PA Mitsui Chemicals, Inc., 1-5-2, Higashi-Shimbashi, Minato-ku, Tokyo
 105-7117, JP
 PAN 2402683
 AG HOFFMANN EITLE, Patent- und Rechtsanwaelte Arabellastrasse 4, 81925
 Muenchen, DE
 AGN 101511
 DT Patent
 LAF Japanese
 LA English
 LAP English
 TL German; English; French
 PIT EPA1 Application published with search report
 PI EP 1612232 A1 20060104
 WO 2004090015 20041021
 DS DE FR GB
 AI EP 2004-724116 A 20040329
 WO 2004-JP4392 A 20040329
 PRAI JP 2003-102674 A 20030407
 IPCI C08G0065-40 [I,A]; H01M0004-96 [I,A]; H01M0008-02 [I,A]
 C08G0065-00 [I,C*]; H01M0004-96 [I,C*]; H01M0008-02 [I,C*]

 L2 ANSWER 2 OF 4 EPFULL COPYRIGHT 2007 EPO/FIZ KA on STN

 AN 2002:109111 EPFULL
 DUPD 20030625 DUPW 200326
 TIEN CROSSLINKABLE AROMATIC RESINS HAVING
 PROTONIC ACID GROUPS, AND ION−CONDUCTIVE
 POLYMER MEMBRANES, BINDERS, AND FUEL CELLS MADE BY USING THE
 SAME.

TIFR RESINES AROMATIQUES RETICULABLES COMPORTANT DES GROUPES D'ACIDES
 PROTONIQUE, MEMBRANES POLYMERES CONDUCTRICES D'IONS, LIANTS ET PILES A
 COMBUSTIBLE OBTENUES A L'AIDE DE CELLES-CI.

IN ISHIKAWA, Junichi, Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 KUROKI, Takashi, Mitsui Chemicals, Inc., 580-32, Nagaura, Sodegaura-shi,
 Chiba 299-0265, JP;
 FUJIYAMA, Satoko, Mitsui Chemicals, Inc., 580-32, Nagaura,
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 OMI, Takehiko, Mitsui Chemicals, Inc., 580-32, Nagaura, Sodegaura-shi,
 Chiba 299-0265, JP;
 NAKATA, Tomoyuki, Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 OKAWA, Yuichi, Mitsui Chemicals, Inc., 580-32, Nagaura, Sodegaura-shi,
 Chiba 299-0265, JP;
 MIYAZAKI, Kazuhisa, Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 FUJII, Shigeharu, Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 TAMAI, Shoji, Mitsui Chemicals, Inc., 580-32, Nagaura, Sodegaura-shi,
 Chiba 299-0265, JP

PA Mitsui Chemicals, Inc., 2-5, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo
 100-6070, JP

PAN 213645
 DT Patent
 LAF Japanese
 LA English
 LAP English
 TL English; French

PIT WOA1 International application published with search report
 PI WO 2003033566 A1 20030424
 DS DE FR GB IT SE
 EXTENSION STATES: AL LT LV MK RO SI

AI EP 2002-775319 A 20021010
 WO 2002-JP10536 A 20021010

PRAI JP 2001-312799 A 20011010
 JP 2002-182252 A 20020621

IC.VER 7
 ICM C08G065-40
 ICS C08G069-48; C08G073-10; C08J005-22; H01M008-02

AN 2002:109111 EPFULL UP 20050302
 DUPD 20050302 DUPW 200509

TIEN CROSSLINKABLE AROMATIC RESINS HAVING
 PROTONIC ACID GROUPS AND ION CONDUCTIVE POLYMER
 MEMBRANES BINDERS AND FUEL CELLS MADE BY USING THE SAME.

TIFR RESINES AROMATIQUES RETICULABLES COMPORTANT DES GROUPES D'ACIDES
 PROTONIQUE, MEMBRANES POLYMERES CONDUCTRICES D'IONS, LIANTS ET PILES A
 COMBUSTIBLE OBTENUES A L'AIDE DE CELLES-CI.

TIDE VERNETZBARE AROMATISCHE HARZE MIT PROTONENSAEUREGRUPPEN UND
 IONENLEITENDE POLYMERMEMBRANEN, BINDEMittel UND DAMIT HERGESTELLTE
 BRENNSTOFFZELLEN.

IN ISHIKAWA, Junichi, Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 KUROKI, Takashi, Mitsui Chemicals, Inc., 580-32, Nagaura, Sodegaura-shi,
 Chiba 299-0265, JP;
 FUJIYAMA, Satoko, Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 OMI, Takehiko, Mitsui Chemicals, Inc., 580-32, Nagaura, Sodegaura-shi,
 Chiba 299-0265, JP;
 NAKATA, Tomoyuki, Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 OKAWA, Yuichi, Mitsui Chemicals, Inc., 580-32, Nagaura, Sodegaura-shi,
 Chiba 299-0265, JP;

MIYAZAKI, Kazuhisa, Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 FUJII, Shigeharu, Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP;
 TAMAI, Shoji, Mitsui Chemicals, Inc., 580-32, Nagaura, Sodegaura-shi,
 Chiba 299-0265, JP

PA MITSUI CHEMICALS, INC., 5-2, Higashi-Shimbashi 1-Chome Minato-ku, Tokyo,
 JP

PAN 5013870

AG HOFFMANN - EITLE, Patent- und Rechtsanwaelte Arabellastrasse 4, 81925
 Muenchen, DE

AGN 101511

DT Patent

LAF Japanese

LA English

LAP English

TL German; English; French

PIT EPA1 Application published with search report

PI EP 1457511 A1 20040915
 WO 2003033566 20030424

DS DE FR GB

AI EP 2002-775319 A 20021010
 WO 2002-JP10536 A 20021010

PRAI JP 2001-312799 A 20011010
 JP 2002-182252 A 20020621

IC.VER 7

ICM C08G065-40

ICS C08G069-48; C08G073-10; C08J005-22; H01M008-02

L2 ANSWER 3 OF 4 PCTFULL COPYRIGHT 2007 Univentio on STN

AN 2003033566 PCTFULL ED 20030430 EW 200317

TIEN CROSSLINKABLE AROMATIC RESINS HAVING
 PROTONIC ACID GROUPS, AND ION-CONDUCTIVE POLYMER
 MEMBRANES, BINDERS, AND FUEL CELLS MADE BY USING THE SAME

TIFR RESINES AROMATIQUES RETICULABLES COMPORTANT DES GROUPEES D'ACIDES
 PROTONIQUES, MEMBRANES POLYMERES CONDUCTRICES D'IONS, LIANTS ET PILES A
 COMBUSTIBLE OBTENUES A L'AIDE DE CELLES-CI

IN ISHIKAWA, Junichi, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP];
 KUROKI, Takashi, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP];
 FUJIYAMA, Satoko, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP];
 OMI, Takehiko, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP];
 NAKATA, Tomoyuki, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP];
 OKAWA, Yuichi, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP];
 MIYAZAKI, Kazuhisa, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP];
 FUJII, Shigeharu, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP];
 TAMAI, Shoji, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP]

PA MITSUI CHEMICALS, INC., 2-5, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo
 100-6070, JP [JP, JP], for all designates States except US;
 ISHIKAWA, Junichi, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP], for US only;
 KUROKI, Takashi, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP], for US only;
 FUJIYAMA, Satoko, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP], for US only;
 OMI, Takehiko, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,

Sodegaura-shi, Chiba 299-0265, JP [JP, JP], for US only;
 NAKATA, Tomoyuki, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP], for US only;
 OKAWA, Yuichi, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP], for US only;
 MIYAZAKI, Kazuhisa, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP], for US only;
 FUJII, Shigeharu, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP], for US only;
 TAMAI, Shoji, c/o Mitsui Chemicals, Inc., 580-32, Nagaura,
 Sodegaura-shi, Chiba 299-0265, JP [JP, JP], for US only
 AG NAKAJIMA, Shigemitsu, Nichiyo Bldg. 3F, 11-12, Kanda Mitoshiro-cho,
 Chiyoda-ku, , Tokyo 101-0053, JP
 LAF Japanese
 LA Japanese
 DT Patent
 PI WO 2003033566 A1 20030424
 DS W: CA CN IN JP KR US
 RW (EPO): DE FR GB IT SE
 PRAI JP 2001-2001-312799 20011010
 JP 2002-2002-182252 20020621
 AI WO 2002-JP10536 A 20021010
 ICM C08G065-40
 ICS C08G069-48; C08G073-10; C08J005-22; H01M008-02

 L2 ANSWER 4 OF 4 USPTFULL on STN
 AN 2004:247008 USPTFULL
 TI Crosslinkable aromatic resin having
 protonic acid group, and ion conductive polymer
 membrane, binder and fuel cell using the resin
 IN Ishikawa, Junichi, Sodegaura-shi, JAPAN
 Kuroki, Takashi, Sodegaura-shi, JAPAN
 Fujiyama, Satoko, Sodegaura-shi, JAPAN
 Omi, Takehiko, Sodegaura-shi, JAPAN
 Nakata, Tomoyuki, Sodegaura-shi, JAPAN
 Okawa, Yuichi, Sodegaura-shi, JAPAN
 Miyazaki, Kazuhisa, Sodegaura-shi, JAPAN
 Fujii, Shigeharu, Sodegaura-shi, JAPAN
 Tamai, Shoji, Sodegaura-shi, JAPAN
 PA MITSUI CHEMICALS, INC., Minato-ku, JAPAN (non-U.S. corporation)
 PI US 2004191602 A1 20040930
 AI US 2004-820842 A1 20040409 (10)
 RLI Continuation-in-part of Ser. No. WO 2002-JP10536, filed on 10 Oct 2002,
 UNKNOWN
 PRAI JP 2001-312799 20011010
 JP 2002-182252 20020621
 DT Utility
 FS APPLICATION
 LN.CNT 4578
 INCL INCLM: 429/033.000
 INCLS: 429/030.000; 429/040.000; 429/042.000; 429/310.000; 429/311.000;
 429/312.000; 429/316.000; 429/317.000
 NCL NCLM: 429/033.000
 NCLS: 429/030.000; 429/040.000; 429/042.000; 429/310.000; 429/311.000;
 429/312.000; 429/316.000; 429/317.000
 IC [7]
 ICM H01M008-10
 ICS H01M004-86; H01M004-90; H01M004-96; H01M006-18
 IPCI H01M0008-10 [ICM,7]; H01M0004-86 [ICS,7]; H01M0004-90 [ICS,7];
 H01M0004-96 [ICS,7]; H01M0006-18 [ICS,7]
 IPCR C08G0065-00 [I,C*]; C08G0065-48 [I,A]; C08J0005-20 [I,C*];
 C08J0005-22 [I,A]; C08L0071-00 [I,C*]; C08L0071-00 [I,A];
 C08L0071-12 [I,A]; C08L0081-00 [I,C*]; C08L0081-06 [I,A];
 H01M0004-86 [N,C*]; H01M0004-86 [N,A]; H01M0004-88 [I,C*];

H01M0004-88 [I,A]; H01M0004-90 [N,C*]; H01M0004-92 [N,A];
H01M0008-10 [I,C*]; H01M0008-10 [I,A]

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

=>

aromatic polyethers, aromatic polyamides, aromatic polyimides, aromatic polyamideimides and aromatic polyazoles.

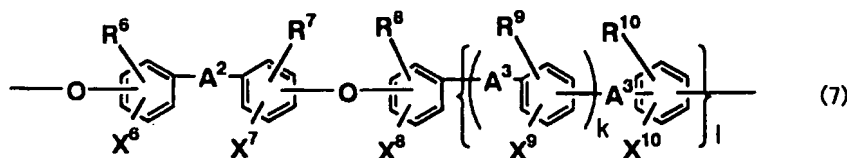
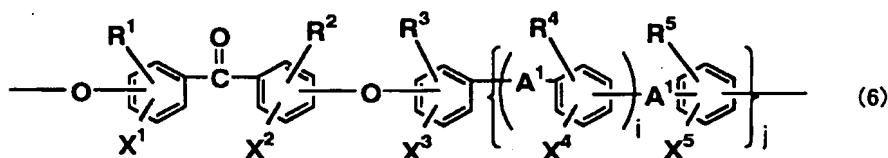
5. (Original) The crosslinkable aromatic resin having a protonic acid group according to claim 2, wherein the crosslinkable aromatic resin having a protonic acid group is a photo-crosslinkable polyether ketone containing a protonic acid group and an aromatic ring to which an alkyl group having 1 to 10 carbon atoms and/or an alkylene group having 1 to 3 carbon atoms in the main chain in which at least one carbon atom directly bonded to the aromatic ring bonds to hydrogen directly bonded.

6. (Currently Amended) The crosslinkable aromatic resin having a protonic acid group according to claim 2, wherein the crosslinkable aromatic resin having a protonic acid group is an aromatic polyetherketone comprising, based on the total repeating structural units,

10 to 100 % by mol of the repeating structural unit represented by the following formula (6) below, and

0 to 90 % by mol of the repeating structural unit represented by the following formula (7) below,

in which at least one of R^1 to R^{10} is $-C_mH_{2m+1}$ (wherein m is an integer of 1 to 10) and at least one of X^1 to X^{10} is a protonic acid group[.];



[in formulas (6) and (7), each of R^1 to R^{10} independently represents H or $-C_mH_{2m+1}$ (wherein m is an integer of 1 to 10), each of X^1 to X^{10} independently represents H or a protonic acid group; each of A^1 to A^3 independently represents a direct bond, $-CH_2-$, $-C(CH_3)_2-$, $-C(CF_3)_2-$, $-O-$, $-SO_2-$ or $-CO-$; each of i , j , k and l independently represents 0 or 1; and the hydrogen

112, end paragraph

atom bonded to the aromatic rings in the formula (6) and (7) may be substituted with - C_mH_{2m+1} (wherein m is an integer of 1 to 10), a protonic acid group, Cl, F or CF_3 .]

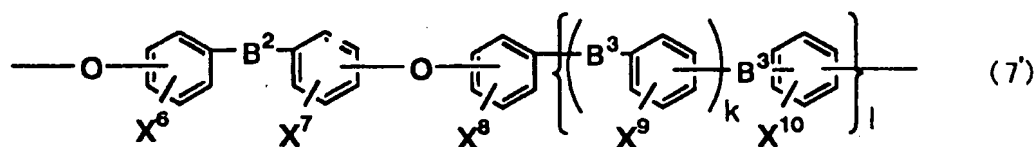
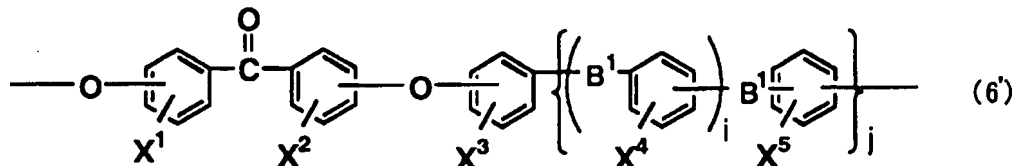
7. (Currently Amended) The crosslinkable aromatic resin having a protonic acid group according to claim 2, wherein the crosslinkable aromatic resin having a protonic acid group is an aromatic polyetherketone comprising, based on the total repeating structural units,

10 to 100 % by mol of the repeating structural unit represented by the following formula (6') below, and

0 to 90 % by mol of the repeating structural unit represented by the following formula (7') below,

in which at least one of B^1 to B^3 is a group represented by the formula: -

$CH(C_xH_{x+1})\{C(C_yH_{y+1})(C_yH_{y+1})\}_\alpha\{C(C_zH_{z+1})(C_zH_{z+1})\}_\beta$, wherein x is an integer of 0 to 9, each of y, y', z and z' is independently an integer of 0 to 8, each of α and β is independently of 0 or 1 and $x+y+y'+z+z'+\alpha+\beta \leq 9$, and at least one of X^1 to X^{10} is a protonic acid group[.]:



[in formulas (6') and (7'), each of X^1 to X^{10} independently represents H or a protonic acid group; each of B^1 to B^3 independently represents a direct bond, $-C(CF_3)_2$, $-SO_2$, $-CO$ - or a group represented by the formula: $-CH(C_xH_{x+1})\{C(C_yH_{y+1})(C_yH_{y+1})\}_\alpha\{C(C_zH_{z+1})(C_zH_{z+1})\}_\beta$, wherein x is an integer of 0 to 9, each of y, y', z and z' is independently an integer of 0 to 8, each of α and β is independently of 0 or 1 and $x+y+y'+z+z'+\alpha+\beta \leq 9$; each of i, j, k and l independently represents 0 or 1; and the hydrogen atom bonded to the aromatic rings in the